



AMENDMENTS TO THE CLAIMS:

1-12. (canceled)

13. (currently amended) A medical method comprising:

providing a carrier holding a multiplicity of electromechanical transducers;

placing said carrier and a patient adjacent to one another so that said transducers are disposed in effective pressure-wave-transmitting contact with the patient;

supplying a first plurality of said transducers with electrical signals of at least one pre-established ultrasonic frequency to produce first pressure waves in the patient;

receiving, via a second plurality of said transducers, second pressure waves produced at internal tissue structures of the patient in response to said first pressure waves;

performing electronic 3D volumetric data acquisition by solely an electronic scanning of said internal tissue structures; and

performing electronic 3D imaging of said internal tissue structures in part by analyzing signals generated by said second plurality of said transducers in response to said second pressure waves,

at least one of the supplying and receiving steps being executed to effectuate the electronic scanning of said internal tissue structures,

the performing of said electronic 3D data acquisition including coherently combining data generated via said transducers.

14. (original) The method defined in claim 13 wherein the electronic scanning is accomplished by varying a time delay of said electrical signals across said first plurality of said transducers to effectuate a phased-array electronic scanning of internal tissues of the patient by said first pressure waves.

15. (original) The method defined in claim 14 wherein the varying of the time delay of said electrical signals includes operating switching circuitry operatively connected to said first plurality of said transducers.

16. (original) The method defined in claim 13 wherein the electronic scanning is accomplished by varying sampling time or phase of said second plurality of said transducers.

17. (original) The method defined in claim 16 wherein the varying of the sampling time or phase of said electrical signals includes operating switching circuitry operatively connected to said second plurality of said transducers.

18. (original) The method defined in claim 13 wherein said carrier is rigid, further comprising disposing a flexible fluid-filled bag between the patient and said carrier and transmitting said first pressure waves and receiving said second pressure waves through said fluid filled flexible bag.

19. (original) The method defined in claim 13, further comprising varying

said frequency to facilitate collection of three-dimensional structural data pertaining to tissue structures at different depths in the patient.

20. (original) The method defined in claim 13, further comprising generating an image of the internal tissues of the patient on at least one display.

21. (original) The method defined in claim 13, further comprising maintaining said transducers in substantially fixed positions relative to one another during:

the supplying of said first plurality of said transducers with said electrical signals;  
the receiving, via said second plurality of said transducers, of said second pressure waves; and  
the performing of said 3D volumetric data acquisition and imaging of said internal tissue structures.

22-30. (canceled)

31. (original) A medical method comprising:  
providing a carrier holding a multiplicity of electromechanical transducers  
defining respective data gathering apertures;  
placing said carrier and a patient adjacent to one another so that said transducers are disposed in effective pressure-wave-transmitting contact with the patient;  
supplying a first plurality of said transducers with electrical signals of at least one

pre-established ultrasonic frequency to produce first pressure waves in the patient;

receiving, via a second plurality of said transducers, second pressure waves produced at internal tissue structures of the patient in response to said first pressure waves; and

performing electronic 3D volumetric data acquisition and imaging of said internal tissue structures by analyzing signals generated by said second plurality of said transducers in response to said second pressure waves,

at least one of the steps of supplying and receiving including coherently combining structural data from the respective apertures.

32. (original) The method defined in claim 31 wherein said carrier includes a plurality of rigid substrates and wherein the step of coherently combining includes determining relative positions and orientations of said substrates relative to one another.

33. (original) The method defined in claim 32 wherein each of said substrates is provided with a plurality of point scatterers, the determining of relative positions and orientations of said substrates including periodically scanning said point scatterers with ultrasonic pressure waves and calculating instantaneous positions of said point scatterers.

34. (original) The method defined in claim 33 wherein the determining of relative positions and orientations of said carriers includes executing computations according to a self-cohering algorithm.

35. (original) The method defined in claim 32 wherein the determining of relative positions and orientations of said carriers includes periodically energizing at some of said transducers with at least one predetermined electrical frequency and calculating instantaneous positions of the transducers so energized.

36. (original) The method defined in claim 35 wherein the determining of relative positions and orientations of said carriers includes executing computations according to a self-cohering algorithm.

37. (canceled)

38. (canceled)

39. (original) A medical method comprising:

disposing a multiplicity of electromechanical transducers in a predetermined array in effective pressure-wave-transmitting contact with a patient;

after the disposing of said transducers in contact with the patient, selectively energizing a first plurality of said transducers to transmit a plurality of ultrasonic pulses into the patient, said pulses inducing a generation of reflected pressure waves at internal

tissue structures in the patient, said pulses being transmitted into the patient prior to a return to said transducers of a substantial amount of the reflected pressure waves, said pulses being differentially coded to enable detection of respective series of reflected pressure waves;

receiving, via a second plurality of said transducers, the reflected pressure waves produced at the internal tissue structures of the patient in response to said pulses;

decoding the reflected pressure waves to associate the reflected pressure waves with respective ones of said pulses; and

performing electronic 3D volumetric data acquisition and imaging of said internal tissue structures in part by analyzing the decoded received reflected pressure waves.

40. (original) The method defined in claim 39 wherein the differential coding of said pulses is a spatial coding.

41. (original) The method defined in claim 40 wherein said pulses are transmitted in respective different directions into the patient.

42. (original) The method defined in claim 39 wherein said transducers are mounted to a flexible web, the disposing of said transducers in a predetermined array in effective pressure-wave-transmitting contact with a patient including placing said web in contact with the patient.

43-45. (canceled)

46. (currently amended) A medical method comprising:

providing a carrier holding a multiplicity of electromechanical transducers;

placing said carrier and a patient adjacent to one another so that said transducers are disposed in effective pressure-wave-transmitting contact with the patient;

supplying a first plurality of said transducers with electrical signals of at least one pre-established ultrasonic frequency to produce first pressure waves in the patient;

receiving, via a second plurality of said transducers, second pressure waves produced at internal tissue structures of the patient in response to said first pressure waves;

executing the supplying and receiving steps to ~~effectuate~~ organize said transducers into multiple data-gathering apertures effectuating an electronic scanning of said internal tissue structures in elevation and an electronic scanning of said internal tissue structures in azimuth, thereby acquiring electronic 3D volumetric data; and

performing electronic 3D imaging of said internal tissue structures in part by analyzing signals generated by said second plurality of said transducers in response to said second pressure waves.

47. (currently amended) A medical scanning method comprising:

providing a plurality of electromechanical sensors mounted to a carrier;

disposing said carrier in relation to a patient;

after the disposing of said carrier, activating said sensors to effectuate a solely electronic ultrasonic-wave scan of internal organic structures of the patient resulting in

encoded three-dimensional structural data pertaining to the internal organic structures, the activating of said sensors including exciting said sensors to define multiple data-gathering apertures; and

operating on the data from said ~~sensors~~ apertures to produce an electronically encoded three-dimensional model or analog of said internal organic structures.

48. (previously presented) The method defined in claim 48 wherein said three dimensional model is produced from said data alone.

49. (previously presented) The method defined in claim 48, further comprising generating an image of at least one of said internal structures from said model.